Staff Papers Series

Staff Paper P86-54 December 1986

Structure and Performance of the Land Market
in the United States

Philip M. Raup

Department of Agricultural and Applied Economics

University of Minnesota
Institute of Agriculture, Forestry and Home Economics
St. Paul, Minnesota 55108

Staff Paper P86-54 December 1986

Structure and Performance of the Land Market in the United States

Philip M. Raup

Structure and Performance of the Land Market in the United States*

Philip M. Raup**

The primary characteristic of the agricultural land market in the United States is diversity. It is conventional to speak of "the farm land market", or of the trend in "land prices", but this conveys a false image. There is no national market, in the sense in which we can speak of a grain market or a livestock market. This is inherent in the immobility of land, and in the diversity of soils and climate. Markets for farm land do exist, but they are predominantly local in character. They are strongly influenced by the presence or absence of available non-farm employment opportunities, and by proximity to urban centers. There is an active interaction between land markets and labor markets, and the two markets have many characteristics in common.

In this sense it is important to begin a description of the function of farm land markets by noting that they reflect the interaction of two major components:

---

* Paper No. 2132, Miscellaneous Journal Series, Minnesota Agricultural Experiment Station, University of Minnesota. Paper prepared for International Workshop on the Agricultural Real Estate Market and Land Prices: Analysis and Policy Regulations, Universidad Internacional Menendez Pelayo, Seville, Spain, Sept. 24-26, 1986.

**Professor Emeritus, Department of Agricultural and Applied Economics, University of Minnesota, St. Paul, Minnesota, USA. In developing this paper I have benefitted from conversations with many individuals, especially C. Ford Runge and Vernon W. Ruttan.

a.) The capitalized valuation of the income flow from the land, in agricultural uses.

b.) The value of the land in alternative non-farm uses.

A major feature of the patterns of land use in the United States is the extent to which these two sources of land value have become intermixed. There is still a large area of agricultural land in the United States that has only agricultural value, but this proportion is declining. The area of farm land that is subject to non-farm demand has increased rapidly in the past four decades. This has been one of the most emphatic results of the massive investment in roads and highways, since 1956, and of jet air travel. This transport revolution has been strongly supported by the extension of the rural electric power grid to cover virtually all rural communities and farmsteads. An urban life style is now possible even in remote rural areas, and the degree of their remoteness has steadily diminished. One result is that rural residential and recreational land uses have become major competitors for much of the nation's farm land. The rural land market is no longer synonymous with the farm land market, and much of the value of nominal farm land reflects a non-farm demand.

A recent Texas study provides a striking illustration of this trend. Using data on the market value of rural land in Texas in 1981, Pope estimated that less than one-fourth of this value could be explained by average net returns to the

land from agricultural use. Over three-fourths of its value was apparently based on the use of the land as a consumption good or on anticipated inflation that was not a result of its value as an input in agricultural production (Pope, 1985, p. 85). In more highly urbanized areas the strength of this non-farm component in demand has priced farm land at levels that have little relation to the profitability of farming. This is reflected in the fact that farm land values in all but three states in the heavily urbanized Northeastern United States were stable or higher in 1986 than they were in 1981, while farm land values in the agricultural Middle West and Great Plains states fell in this same period by 40 to 50 percent, or more (USDA, 1986).

Although non-farm demand is a new and massive element in the structure of farm land markets, it remains true that farmers are the principal buyers of farm land. For the 48 contiguous states in 1985, owner-operator or tenant farmers accounted for 75 percent of all purchases of farm land, 71 percent of all acres bought, and 72 percent of the value exchanged in all transactions (USDA, 1985). No national data exist to illustrate the extent to which this farmer demand for farm land is localized, but data from one state, Minnesota, are revealing. In 1985 in Minnesota, 81 percent of all purchasers of farm land lived less than 10 miles from the land they purchased (Dion and Raup, 1986, p. 32).

The structure of the demand side of the farmland market is also characterized by a significant component of investor buyers. Determining their numbers and significance is difficult, since it involves a determination of the reasons for purchases, and these defy any simple classification. One objective indicator is the proportion of sales of farmland to non-farmers. Historically, this proportion has varied tremendously by regions, with the highest proportions in 1986 in the Northeast (38 percent), Southeast (48 percent), and the Appalachian region (41 percent). In contrast, non-farmer buyers accounted for only 16 percent of all sales in the Northern Plains, 17 percent in the Mountain states, and 25 percent in the Corn Belt (USDA, 1986).

A major structural change in the market for farm land since the 1950's has resulted from the expansion in the number of farms operated by part-owners, i.e., farmers who own a part of the land they farm and rent in additional land. This trend has been associated with a sharp expansion in the average size of farms, which more than doubled from 1950 to 1986, from 215 acres (87 hectares) to 455 acres (184 hectares).

For the U.S. as a whole and beginning in the 1950's, there has been a sharp increase in the proportion of farmland operated under lease or rental arrangements by part-owners, while at the same time there has been remarkable stability in the proportion of the total acres of rented land to the acres

of all land in farms. U.S. Census of Agriculture data for 1945 reported 37.8 percent of all acres in farms as operated by tenants (either full tenants or part owners). The figure was 37.3 percent in 1969, 39.6 percent in 1978 and 38.9 percent in 1982. The major shift that occurred was a drop in the percentage operated by full tenants, from 22.1 percent in 1945 to 11.5 percent in 1982. Rented land operated by part owners increased from 15.7 percent in 1945 to 24.4 percent in 1969 and to 27.4 percent in 1982.

These changes have resulted in a massive restructuring of farm equity but with little change in the proportion of farm land rented. The typical U.S. farmer in 1982 was a part-owner. In 1982, part-owners owned 26.4 percent of all land in farms, and rented in an additional 27.4 percent. When combined with the 34.7 percent of farm land held by full owners, the result is that 88.5 percent of all land in farms in 1982 was in the hands of operators who owned some or all of the land they farmed. This is the highest proportion in this century.

The rental market emerges as the major instrument by which equity sharing is being accomplished in U.S. agriculture. Heirs leaving the farm have typically retained ownership of their fraction of the land, and rented it to neighbors or to siblings. This is one of the major ways in which farm size expansion has been achieved.

The other major way has been through purchase of land by neighboring farmers from those retiring or quitting farming. This has transformed the nature of the farmland market. Prior to the 1950's the principal function of the market was to accomplish the transfer of farm land from generation to generation. The unit of transfer was typically a complete farm operating unit, including buildings. The predominant buyers were younger farmers, buying the land for continued operation as intact farm units.

Since the 1950's this inter-generational transfer function of the market has undergone a profound change. This can be illustrated by data on the composition of buyers in the farmland market in Minnesota. In the mid-1950's, buyers of farm land who intended to operate the land as intact farm units accounted for 60 percent of all purchases. Buyers who were adding the purchased land to land already owned (farm expansion buyers) made up one-fourth of all buyers, and investor buyers who did not intend to farm the land themselves and were not adding the purchased land to land already owned accounted for the remaining 15 percent of the transactions.

Over the past thirty years the proportion of farm land purchases by farm expansion buyers has increased almost without interruption, reaching a peak of 80 percent of all transfers in 1984 and dropping back to 74 percent in 1985. In contrast, farm purchases by individuals who intended to

operate the land as intact farm units were only 13 percent of all transfers in 1985, and investor buyers accounted for the remaining 13 percent. In the mid-1950's the farm land market in Minnesota had been primarily a mechanism to facilitate inter-generational transfers. Since the mid-1960's its function has been transformed into a mechanism to promote farm size enlargement (Dion and Raup, 1986, pp. 23-25). Although no time series of comparable data exist for other states, it is reasonable to conclude that this transformation is typical of other agricultural regions.

The predominance of farm expansion buyers is a major part of the explanation for the unprecedented increase in farm land prices that began slowly in the 1960's and reached land-boom proportions in the 1970's. On a national scale (for the 48 contiguous states), the average value of farm land per acre in nominal dollars doubled from 1958-59 to 1971-72, doubled again by 1976-77 and doubled again by 1981-82. At its peak in 1982 an average acre of farm land was worth $823, or eight times its value of $103 in 1958 (USDA, 1985B). It had required one hundred years, from approximately 1860 to 1960, to achieve a comparable proportionate increase in farm land value, and this most recent increase had occurred in less than 25 years (Pressly and Scofield, 1965, p. 7).

In one sense, the increase in land values in the 1960's and 1970's was a consequence of the revolution in mechanical

technology in agriculture that permitted one man to operate a greatly increased acreage. A realization of this potential enabled those who already owned land to use it as collateral for the credit needed to buy more land. The farm expansion buyer could offer a price for additional land that could not be justified by earnings from the land alone, but could be financed by pooling land purchased with land already owned to create the necessary credit base. If indebtedness on the existing holding was low, or if the land had been acquired through inheritance, the temptation to buy more land was irresistible. In effect, the earnings from the entire holding could be pledged to pay for an additional purchase.

This process gave a tremendous advantage in the land market to those already owning farm land, especially if it was inherited, or encumbered with little debt. As we have seen, expansion buyers dominated the market in its inflationary phase. When the market collapsed after 1981-82, many of those most seriously hurt were the bigger farmers, using the most modern equipment, and holding inherited land, some of which had been in the same family since the years of first settlement.

The disinflation in farm land values in the United States since 1981-82 has been as unprecedented as was the rise preceding it, and it is still continuing. Its most disastrous consequences have been in the grain belts devoted to corn, soybeans, wheat and sorghum. From 1981 to 1986 the

value of farm land and buildings dropped 58 percent in Iowa, 53 percent in Minnesota and 50 percent in Nebraska. Declines of 38 percent or more occurred in all states in the Lake States, the Corn Belt, and the Northern Plains, with the exception of Michigan and North Dakota (USDA, 1986).

The area most severely affected includes a group of contiguous states and parts of states in which corn, soybeans, and wheat predominate. These were the crops whose prospects in foreign markets had been most encouraging in the years of expected world food shortages in the 1970s. These were also crops for which the potentials of mechanized farming had been most fully developed and exploited. In terms of land use for field crops, the greatest decline in farm land values occurred in those crop sectors that had experienced the greatest increases in labor productivity. This was undoubtedly associated with the euphoric way in which land prices had been bid up by farm expansion buyers in the land boom that ended in 1981.

A related technological transformation in U.S. agriculture provides insight into the way in which the land market functions in an equilibrating role. One of the most fundamental changes in agricultural production has involved the substitution of purchased inputs to substitute for the manpower, horsepower, seeds, fertilizers and other production requirements once produced on farms. This transformation is shown in Table 1. The shifts in the percentage distribution

Table 1: U.S., Percentage Distribution of Farm Inputs[a/]
1910-1984

Year	Labor	Farm Real Estate	Inputs Involving Production Credit				Taxes, Int.	Mscl.
			Mech. & Machinery	Agr. Chem.	Feed, Seed, Livestock Purch.	Sub-Total		
			PERCENTAGE OF TOTAL 1935-39 WEIGHTS					
1910	53.4	20.2	8.5	1.7	3.2	13.4	8.3	4.7
1915	51.6	19.8	9.8	1.6	3.0	14.4	9.3	4.9
1920	50.0	18.5	11.8	2.1	3.9	17.8	8.8	4.9
1925	48.9	17.8	12.0	2.3	4.6	18.9	9.7	4.7
1930	46.2	17.7	14.1	2.8	4.4	21.3	10.4	4.4
1935	47.0	19.2	12.9	2.7	4.1	19.7	9.7	4.4
1939	42.8	18.4	14.7	3.4	6.2	24.3	10.3	4.2
			1947-49 WEIGHTS					
1939	54.4	17.0	10.1	1.9	6.5	18.5	7.0	3.1
1945	48.0	15.8	14.3	3.2	8.2	25.7	7.4	3.1
1950	38.1	16.7	20.3	4.7	9.4	34.4	7.5	3.3
1955	32.0	16.4	23.3	6.2	10.7	40.2	7.9	3.5
			1957-59 WEIGHTS					
1955	32.2	19.4	24.0	4.4	9.0	37.4	7.7	3.2
1960	26.5	19.4	25.0	5.8	10.9	41.7	8.6	3.8
1965	20.4	19.7	24.9	9.1	12.5	46.5	9.4	4.0
			1967-69 WEIGHTS					
1965	23.2	23.6	26.8	5.3	6.7	38.8	10.8	3.5
1970	19.0	23.0	28.3	8.0	7.4	43.7	10.8	3.5
1975	16.7	21.8	31.5	8.8	7.1	47.4	10.8	3.3
1976	16.0	21.6	31.3	9.6	7.4	48.3	10.5	3.6
			1976-78 WEIGHTS					
1975	17.1	24.1	33.0	8.0	6.2	47.2	8.3	3.2
1980	13.8	24.1	32.5	11.1	7.2	50.8	7.7	3.6
1983	12.9	25.6	31.2	10.3	7.3	48.8	8.3	4.4
1984	13.0	24.8	30.5	11.9	7.2	49.6	8.0	4.8

a/ National Economics Div., Economic Research Service, U.S. Dept. of Agriculture, Washington, D. C., September 1986.

of inputs since 1910 has involved a steady decline in the importance of labor, a stable role for land, and dramatic increases in machinery, fertilizers, chemicals, and purchased seeds.

Labor at the end of the Second World War made up one-half of the total input cost in U.S. agriculture. Purchased inputs requiring cash or production credit were only one-fourth of input costs. By 1984, labor was only 13 percent of input cost, machinery alone was one-third, and production inputs requiring cash or credit made up one-half of the total cost of farm output.

This shift in the cost structure of production has profoundly altered the role played in the land market by family-type farms. In a labor-intensive agriculture, farm operators could gain an advantage in bidding for farm land by accepting a low reward for their labor. By suppressing family consumption, or by raising many children, the farm family could provide a low-cost labor supply. This production-cost advantage could justify a higher price paid for land. Frugality and fertility made a family-type farmer a formidable competitor in the land market.

This is no longer a strategy for success. No tolerable suppression of family levels of living can compensate for the high proportion of total costs of production that must be paid to non-farm suppliers. One result is that the family-type farm, providing most of its labor supply, has lost

shock-absorbing capacity. Falling farm product prices or loss of market outlet leaves the family-type farmer with few options. He cannot dismiss his labor force, and his production costs, including especially depreciation, are largely beyond his control.

The farm owner-operator in the past has had a related advantage in his ability to make a choice between a return on capital and labor income.

Farm owners can balance off declines in labor income against declines in returns to capital, in times of adversity. In order to maintain a return on capital, and thus to prevent a serious decline in net worth, an owner-operator can accept a reduction in his wage rate.

If the owner of capital is not also a worker in the firm, he cannot make this trade-off. If the laborer is not also an asset-owner in the production process, he will insist on the maintenance of his wage rate, even at the expense of a decline in capital values of the assets used in production. He cannot benefit from a trade of labor income for increases in net worth.

This too has profound implications for the land market. If the asset-owner has little control over the wage-rate, i.e. if a farm relies heavily on hired labor, then any economic shock must be borne by a decline in profits and ultimately in asset values.

Where labor has become a small fraction of the cost of production, or where labor has no equity in production assets, the effect of any loss in profitability is magnified in its consequences for asset values. This characterizes much of the adjustment process now under way in U.S. agriculture, with falling land values providing most of the adjustment to reduced prospects for farm income. In the past, farm families had provided much of the capacity to absorb economic shock by accepting a lower level of income. This source of resiliency is now greatly reduced.

There is an international dimension to this shift of shock-absorbing capacity to the agricultural land market. In countries in which price levels for farm products are inflexible, there is no mechanism to signal farmers that surpluses are in prospect and that production should be cut back. This failure of product prices to guide production shifts any adjustment in volume of production to the trading partners of the countries with inflexible prices. This is the situation today with respect to agricultural trade between the United States, the European Economic Community, and the Soviet Union. In the case of the EEC, farm product prices are above world market levels, and the resultant excess output is being exported at high cost in subsidies, with no price-level link to tell producers to reduce output. As a result, the EEC has shifted from a net grain importer of 12 million tons in 1978/79 and 1979-80 to a net grain

exporter of 15 million tons in 1984/85 and 1985/86 (USDA, 1986B). This reduction of roughly 27 million tons of export market capacity once available to other exporters has forced adjustment to come through changes in those prices that still are flexible. The major route for this price adjustment has been through declining market shares and reduced export potentials for U.S. grains. It is not surprising that the major adjustment in terms of prices has been in the price of U.S. grain producing land.

An opposite effect has characterized trade with the USSR. Prices to USSR producers have not reflected shortages in domestic grain supply, and output has consistently fallen far below consumption for the past 15 years. One result is that variations and shortfalls in Soviet grain production have been transmitted directly to the international market. In the 1970's, this led to exaggerated expectations regarding long-run levels of world trade in grains. This was reflected in U.S. agricultural price support policies in the late 1970's that held grain prices at higher levels than could be maintained by available export markets. Those unrealistic grain prices fueled the land price boom in the United States in the 1970s, and have played a major role in shaping the response of the U.S. farm land market in the 1980's. It seems probable that future trends in U.S. farm land prices will depend increasingly on agricultural policies in other countries and especially in the EEC and the USSR. This

prospect underlines the importance of a better understanding among nations of the international significance of domestic policies. There is a diminishing supply of international shock absorbers that can respond on the scale represented by recent trends in the price of U.S. farm land.

These reflections give rise to a worrying question: Is U.S. agriculture losing its ability to compete in international markets? With reference to the structure and function of land markets, the question can be rephrased: How much price reduction in exported grains can be absorbed by further reductions in land values? Consider the following truisms:

a.) Taxes on land reduce land values.

b.) Similarly, high prices for purchased farm inputs reduce land values.

c.) High wages in industries producing farm equipment, chemicals or fertilizers, or processing farm products also have the same effect as would taxes on land.

We have seen that the higher fraction of total farm production costs represented by purchased inputs reduces the capacity of agriculture to absorb economic shock. This can be measured in two ways:

a.) at the firm level, by reducing the farm family's ability to survive by suppressing consumption, i.e. by cutting labor costs.

b.) at the industry level, by reducing agriculture's capacity to cut export prices and maintain market share by further falls in land values.

When land values are supported by input costs reflecting low labor costs (low family levels of living), the level of land values is a shock-absorbing component of the agricultural structure. If land values fall, production will still continue as long as returns to family labor are above minimum subsistence levels.

As the fraction of total input costs represented by labor costs declines, this shock-absorbing capacity declines. At some point farm product prices can fall so low that all shock-absorbing capacity is lost. This can be a result of:

a.) The exhaustion of economic rent from land

b.) The suppression of labor income to subsistence or sub-subsistence levels.

Until these points are reached or approached, falling product prices may not have a significant depressing effect on production. The capacity of an agricultural economy to tolerate falling farm product prices is thus a combination of the extent to which returns to land have been incorporated into economic rent, or into wage rates that are above opportunity costs of labor.

In the United States, labor as a fraction of total input costs in agriculture has fallen steadily, from about 50 percent in 1945 to about 13 percent in 1984. The opportunity

cost wage rate for farm labor and management in the same period has risen in real terms. There is little shock-absorbing capacity remaining in farm labor and management costs.

In contrast, farm land values had reached record levels in 1981, and a substantial element of economic rent existed to be squeezed out by falling returns from agricultural production. With low and inflexible labor costs, and high and inflexible prices for purchased inputs, the only input prices that could fall were land prices, and this occurred on a massive scale after 1981.

In assessing the effects of these trends on the competitiveness of U.S. agriculture in world markets two key questions remain unanswered:

a.) How much reduction in costs of production can be achieved through further declines in the real cost of land?

b.) Are the feasible declines in either the land or the labor variables sufficient to restore the price of U.S. agricultural exports to competitive levels in world markets?

The most probable answer is that there is still some economic rent in U.S. farm land prices that could be drawn down to support an all-out drive to regain foreign markets. If domestic farm output is not drastically reduced then further declines in land values may take place.

References

Dion, Douglas and Philip M. Raup, 1986: The Minnesota Rural Real Estate Market in 1985, Department of Agricultural and Applied Economics, University of Minnesota, Economic Report No.ER 86-3, May.

Pope, C. Arden, III, 1985: "Agricultural Productive and Consumptive Use Components of Rural Land Values in Texas", American Journal of Agricultural Economics, Vol. 67, No. 1, February.

Pressly, Thomas J. and William H. Scofield, 1965: Farm Real Estate Values in the United States by Counties, 1850-1959, Seattle, University of Washington Press, 1965.

USDA, 1985, A: U.S. Department of Agriculture, Economic Research Service, Agricultural Land Values and Markets, CD-90, August.

USDA, 1985B: U.S. Department of Agriculture, Economic Research Service, Farm Real Estate: Historical Series Data, 1950-85, Statistical Bulletin 738, December.

USDA, 1986A: U.S. Department of Agriculture, Economic Research Service, Agricultural Resources, Agricultural Land Values and Markets, Situation and Outlook Report, AR-2, June.

USDA, 1986B: U.S. Department of Agriculture, Foreign Agricultural Service, Foreign Agricultural Circular, Grains, FG 10-86, August.